WHAT IS CLAIMED IS:

1. A method for remote characterization of a gaseous or vapor sample, comprising:

contacting at least one sensor with a gaseous or vapor sample, wherein the sample contains at least one analyte, the at least one sensor providing a detectable signal when contacted by the at least one analyte;

transmitting data corresponding to the detectable signal to a remote location;

analyzing the data received at the remote location; and

identifying the at least one analyte present in the gaseous or vapor sample thereby characterizing the sample.

2. The method of claim 1, wherein the at least one sensor is a plurality of sensors.

3. The method of claim 1 or 2, wherein the sensor is selected from the group consisting of surface acoustic wave sensors, quartz crystal resonators, metal oxide sensors, dye-coated fiber optic sensors, dye-impregnated bead arrays, micromachined cantilever arrays, composites having regions of conducting material and regions of insulating organic material, composites having regions of conducting material and regions of conducting or semi-conducting organic material, chemically-sensitive resistor or capacitor films, metal-oxide-semiconductor field effect transistors, and bulk organic conducting polymeric sensors.

4. The method of claim 1, wherein the at least one sensor is an electrically conductive sensor.

5. The method of claim 4, wherein the electrically conductive sensor comprises regions of a conductive material and a material compositionally different than the conductive material, wherein the sensor provides an electrical path through the regions of the conductive material and the regions of the compositionally different material, and wherein the conductivity changes upon adsorption with the at least one analyte.

6. The method of claim 5, wherein at least one region of compositionally different material of one sensor is a different thickness than the region of compositionally different material of at least one other sensor.

7. The method of claim 5, wherein the compositionally different material is selected from the group consisting of polyanilines, an emeraldine salt of polyanilines, polypyrroles, polythiophenes, polyEDOTs, and derivatives thereof.

8. The method of claim 5, wherein the conductive material is carbon black, Ag, Au, Pd, Cu, Ni, AuCu, or Pt.

9. The method of claim 7, wherein the sensor further comprises an insulator or plasticizer.

10. The method of claim 1, wherein the at least one sensor comprises composites having regions of a conducting material and regions of a non-conducting organic material.

11. The method of claim 1, wherein the data is a digital representation of the detectable signal.

12. The method of claim 2, wherein the data is a digital profile representation of the detectable signal from each of the plurality of sensors.

13. The method of claim 1, wherein the sample is an environmental sample.

14. The method of claim 13, wherein the environmental sample is an air sample.

15. The method of claim 13, wherein the environmental sample is the headspace of a liquid sample.

16. The method of claim 1, wherein the sample is a biological sample.

17. The method of claim 16, wherein the biological sample is selected from the group consisting of a breath sample, a urine sample, a vaginal sample, a feces sample, a tissue sample and a blood sample.

18. The method of claim 16, wherein the biological sample is a breath sample.

19. The method of claim 1, wherein the data is analyzed by comparing the data to a database comprising a data profile from at least one previously-obtained detectable signal from a sample of known composition.

20. The method of claim 19, wherein the analyte in the sample is identified by matching the data to the data profile of a known composition in the database.

21. The method of claim 1, wherein the data is analyzed by comparing the data to a database containing data profiles from a plurality of detectable signals.

22. The method of claim 21, wherein each data profile in the database is associated with at least one identifier.

23. The method of claim 22, wherein the at least one identifier is selected from the group consisting of location, time, age, sex, disease state, temperature, sample source, sample type, organism, and ethnicity.

24. The method of claim 22, wherein the analyte is identified by a best match of the data to a data profile in the database and identifying any identifiers associated with the data profile.

25. A sensor array system for remote characterization of a gaseous or vapor sample, comprising:

at least one sensor, wherein the at least one sensor provides a detectable signal when contacted by an analyte;

a measuring apparatus, in communication with the at least one sensor capable of measuring the detectable signal;

a transmitting device, in communication with the measuring apparatus for transmitting information corresponding to the detectable signal to a remote location; and

a computer comprising a resident algorithm capable of characterizing the analyte.

26. The system of claim 25, wherein the at least one sensor is a plurality of sensors.

27. The system of claim 25 or 26, wherein the sensor is selected from the group consisting of surface acoustic wave sensors, quartz crystal resonators, metal oxide sensors, dye-coated fiber optic sensors, dye-impregnated bead arrays, micromachined cantilever arrays, composites having regions of conducting material and regions of insulating organic material, composites having regions of conducting material and regions of conducting or semi-conducting organic material, chemically-sensitive resistor or capacitor films, metal-oxide-semiconductor field effect transistors, and bulk organic conducting polymeric sensors.

28. The system of claim 25, wherein the at least one sensor is an electrically conductive sensor.

29. The system of claim 28, wherein the electrically conductive sensor comprises regions of a conductive material and a conductive material compositionally different than the conductive material, wherein the sensor provides an electrical path through the regions of the conductive material and the regions of the compositionally different material, and wherein the conductivity changes upon adsorption with the analyte.

30. The system of claim 29, wherein at least one region of compositionally different material of one sensor is a different thickness than the region of compositionally different material of at least one other sensor.

31. The system of claim 29, wherein the compositionally different material is selected from the group consisting of polyanilines, an emeraldine salt of polyanilines, polypyrroles, polythiophenes, polyEDOTs, and derivatives thereof.

32. The system of claim 29, wherein the conductive material is carbon black, Ag, Au, , Pd, Cu, Ni, AuCu, or Pt.

33. The system of claim 31, wherein the sensor further comprises an insulator or plasticizer.

34. The system of claim 25, wherein the at least one sensor comprises composites having regions of a conducting material and regions of a non-conducting organic material.

35. The system of claim 25, wherein the measuring apparatus converts the detectable signal to a digital representation of the detectable signal.

36. The system of claim 26, wherein the measuring apparatus converts the detectable signal to a digital profile representation of the detectable signal from each of the plurality of sensors.

37. The system of claim 25, wherein the sample is an environmental sample.

38. The system of claim 37, wherein the environmental sample is an air sample.

39. The system of claim 37, wherein the environmental sample is the headspace of a liquid sample.

40. The system of claim 25, wherein the sample is a biological sample.

41. The system of claim 40, wherein the biological sample is selected from the group consisting of a breath sample, a urine sample, a vaginal sample, a feces sample, a tissue sample and a blood sample.

42. The system of claim 40, wherein the biological sample is a breath sample.

43. The system of claim 25, wherein the data is analyzed by comparing the data to a database comprising a data profile from at least one previously-obtained detectable signal from a sample of known composition.

44. The system of claim 43, wherein the analyte in the sample is identified by matching the data to the data profile of a known composition in the database.

45. The system of claim 25, wherein the data is analyzed by comparing the data to a database containing data profiles from a plurality of detectable signals.

46. The system of claim 45, wherein each data profile in the database is associated with at least one identifier.

47. The system of claim 46, wherein the at least one identifier is selected from the group consisting of location, time, age, sex, disease state, temperature, sample source, sample type, organism, and ethnicity.

48. The system of claim 45, wherein the analyte is identified by a best match of the data to a data profile in the database and identifying any identifier associated with the data profile.

49. The system of claim 25, wherein the measuring apparatus is an electrical measuring device in electrical communication with the at least one sensor.

50. The system of claim 25, wherein the resident algorithm is a member selected from the group consisting of principal component analysis, Fisher linear analysis, neural networks, genetic algorithms, fuzzy logic, pattern recognition, and combinations thereof.

51. The system of claim 25, further comprising an information storage device coupled to the measuring apparatus and storing information in the information storage device.

52. The system of claim 49, wherein the measuring apparatus includes a digital-analog converter.

53. The system of claim 25, wherein the measuring apparatus is optimized to detect a member selected from the group consisting of electromagnetic energy, optical properties, resistance, capacitance, inductance, impedance and combinations thereof.

54. The system of claim 25, wherein the analyte is detected in an application which is a member selected from the group consisting of environmental toxicology, remediation, biomedicine, material quality control, food monitoring, agricultural monitoring, heavy industrial manufacturing, ambient air monitoring, worker

protection, emissions control, product quality testing, oil/gas petrochemical applications, combustible gas detection, H_2S monitoring, hazardous leak detection, emergency response and law enforcement applications, explosives detection, utility and power applications, food/beverage/agriculture applications, freshness detection, fruit ripening control, fermentation process monitoring and control, flavor composition and identification, product quality and identification, refrigerant and fumigant detection, cosmetic/perfume applications, fragrance formulation, chemical/plastics/pharmaceuticals applications, fugitive emission identification, solvent recovery effectiveness, hospital/medical applications, anesthesia and sterilization gas detection, infectious disease detection, breath analysis and body fluids analysis.

55. A method for remote characterization of a disease in a subject comprising:

contacting at least one sensor with a gaseous or vapor sample obtained from the subject, wherein the at least one sensor provides a detectable signal when contacted by an analyte present in the sample, the at least one sensor comprising:

regions of a conductive material and regions of a material compositionally different than the conductive material, and wherein the materials provide an electrical path through the regions of conducive material and compositionally different material of the sensor, wherein interaction of the analyte with the sensor changes the resistance of the sensor;

electrically measuring a detectable signal of the sensor;

transmitting data corresponding to the detectable signal to a remote location;

analyzing the data received at the remote location; and

identifying the at least one analyte present in the gaseous or vapor sample thereby characterizing the disease.

56. The method of claim 55, wherein the disease is selected from the group consisting of diabetes, liver cirrhosis, halitosis, periodontal disease, pneumonia,

vaginitis, uremia, trimethylaminuria, lung cancer, dysgensia, dysosnia, cytinuria, and bacterial vaginosis.

57. The method of claim 56, wherein the analyte is an off gas of a member selected from the group consisting of *Prevotella intermedia, Fusobacterium nucleatum, Porphyromonas gingivalis, Porphyromonas endodontalis, Prevotella loescheii, Hemophilus parainfluenzae, Stomatococcus muci, Treponema denticola, Veillonella species, Peptostreptococcus anaerobius, Micros prevotii, Eubacterium limosum, Centipeda periodontii, Selemonad aremidis, Eubacterium species, Bacteriodes species, Fusobacterium periodonticum, Prevotella melaninogenica, Klebsiella pneumoniae, Enterobacter cloacae, Citrobacter species* and *Stomatococcus mucilaginus*.

58. The method of claim 55, wherein the biological sample is a subject's breath, vaginal discharge, urine, feces, tissue sample, or blood sample.

59. A method for remote characterization of a gaseous or vapor sample, comprising:

contacting at least one sensor with a gaseous or vapor sample, wherein the at least one sensor provides a detectable signal when contacted by an analyte present in the sample, the at least one sensor comprising:

regions of a conductive material and regions of a material compositionally different than the conductive material, and wherein the materials provide an electrical path through the regions of conducive material and compositionally different material of the sensor, wherein interaction of the analyte with the sensor changes the resistance of the sensor;

electrically measuring a detectable signal of the sensor;

transmitting data corresponding to the detectable signal to a remote location;

analyzing the data received at the remote location; and

identifying the at least one analyte present in the gaseous or vapor sample thereby characterizing the sample.